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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/536,347	03/27/2000	Andrew D. Bailey III	LAM1P126/P0562	3591

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 04/23/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/536,347

Applicant(s)

BAILEY, ANDREW D.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-18 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) 17-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-16 and 26-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-7, 12, and 26-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Moslehi et al., U.S. Patent 5,464,499.

Moslehi et al. shows the invention as claimed including a wall defining part of the process chamber 10; a device for igniting and sustaining within the process chamber 10 a plasma for said processing, for instance, a RF source 104 (see abstract and Fig. 4); a chuck 24 for supporting said substrate 22 within said plasma confined in said process chamber, wherein said chuck 24 is spaced away from a first end of said process chamber containing a showerhead 52 which is connected to the RF source 104, wherein said plasma is ignited and sustained in a plasma region between said first end of said process chamber and said chuck; and a plasma confinement arrangement 72, comprising a magnetic array having a plurality of magnetic elements (see Fig. 6) that are disposed within said process chamber, said plurality of magnetic elements being configured to produce a magnetic field, and wherein said plurality of magnetic elements are disposed around and extend along said process region (see col. 4-line 66 to col. 9-line 47).

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With respect to claim 3, note that the magnets of the plasma confinement arrangement 72 extend substantially from the first end of the process chamber to the chuck.

Regarding claim 4, note that the magnetic field shown, for instance, in Figure 6 has an azimuthally symmetric radial gradient.

Considering claims 5-6, note that the magnets 72 have a physical axis and a magnetic axis which are perpendicular to one another.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi et al., U.S. Patent 5,464,499 in view of Ye et al., U.S. Patent 6,178,920 B1.

Moslehi et al. is applied as above but lacks anticipation of having the magnet elements individually contained within sleeves. Ye et al. discloses magnetic elements contained in a non-sputtering jacket to prevent plasma within the processing chamber from sputtering underlying material into the processing chamber (see col. 3-line 54 to col. 4-line 11 and Figures 2A, 7A, and 9C and their descriptions). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by Moslehi et al. so as to further comprise magnetic

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elements individually contained within sleeves so as to reduce contamination of the substrate and processing chamber as disclosed by Ye et al..

Claims 8, 10-11, 13, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi et al., U.S. Patent 5,464,499 in view of Shan et al., U.S. Patent 6,113,731.

Moslehi et al. is applied as above but lacks anticipation of the magnetic elements being electromagnets and their rotation to shift the magnetic field over time. Shan et al. discloses the use of electromagnets for generating an electronically rotated magnetic field in order to reduce damage of the substrate being processed and increase radial uniformity of the plasma process being performed on the substrate (see col. 4, lines 45-58; col. 5, lines 1-5; col. 6, lines 51-65; and col. 11-line 65 to col. 12-line 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by the Moslehi et al. reference as to comprise electromagnets as the magnetic elements and to rotate them to shift the magnetic field over time as to optimize the process being performed in the apparatus by reducing the damage of the substrate being processed and increasing radial uniformity of the plasma process being performed on the substrate. Moreover, note that Shan et al. discloses that the electromagnets can be replaced by permanent magnets (see col. 9-lines 50-67 and col. 11-line 65 to col. 12-line 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use electromagnets in the apparatus of Moslehi et al. because there is not evidence that the

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choice of a particular magnetic element would significantly affect the overall performance of the plasma processing apparatus.

Claims 10-11 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi et al., U.S. Patent 5,464,499 in view of Tan et al., U.S. Patent 5,795,451.

Moslehi et al. is applied as above but lacks anticipation of the magnetic elements rotating to shift the magnetic field over time. Tan et al. discloses the use of magnetic elements which are rotated to shift the magnetic field over time in order for a more uniform processing of the substrate, therefore improving the substrate being processed (see col. 1, lines 43-52; and col. 3, lines 9-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus disclosed by Moslehi et al. by comprising a mechanically rotated magnetic field assembly in order to shift the magnetic field over time for optimizing the substrate being processed and the process being performed in the apparatus by reducing the damage of the substrate due to a more uniform processing of the substrate.

Response to Arguments

Applicant's arguments with respect to claims 2-16 and 26-29 have been considered but are moot in view of the new ground(s) of rejection.


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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 305-4545. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills, can be reached on 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 872-9310 for regular communications and 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.


Luz L. Alejandro
Patent Examiner
Art Unit 1763

April 20, 2002